

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA14 | Newton Purcell to Brackley

Operational assessment (SV-004-014)

Sound, noise and vibration

November 2013

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Department
for Transport

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Appendix SV-004-014

Environmental topic:	Sound, noise and vibration	SV
Appendix name:	Operation assessment	004
Community forum area:	Newton Purcell to Brackley	014

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1 Introduction

1.1 Structure of the sound, noise and vibration appendices

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these details the methodology used (Appendix SV-001-000) and relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For Newton Purcell to Brackley community forum area (CFA14), the other three sections are as follows:
- baseline sound, noise and vibration (Appendix SV-002-014);
 - construction sound, noise and vibration (Appendix SV-003-014); and
 - operational sound, noise and vibration (Appendix SV-004-014) (this appendix).
- 1.1.3 The outcomes of this assessment are summarised in Volume 2: CFA14 Report, Chapter 11 Sound, Noise and Vibration.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5 sound, noise and vibration map book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the operation of the Proposed Scheme for the Newton Purcell to Brackley area on:
- people, primarily where they live ('residential receptors') in terms a) individual dwellings and b) on a wider community basis, including any shared community spaces; and
 - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from operational noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- Agriculture, forestry and soils Appendix AG-001-014
 - Community Appendix CM-001-014
 - Ecology Appendix EC-005-002
 - Heritage Appendix CH-003-014
 - Landscape and Visual Appendix LV-001-014

1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of operational noise and vibration impacts and effects and a qualitative assessment of likely significant effects, based on the impacts and effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.
- 1.2.2 Indirect effects arising from permanent changes in traffic patterns on the existing road and rail networks as a consequence of the Proposed Scheme are also reported in this appendix, where they would occur within the study area as defined in Volume 5: Appendix SV-001-000.
- 1.2.3 Route-wide impacts, effects and significant effects associated with noise or vibration from the operation of the Proposed Scheme are reported in Volume 3.
- 1.2.4 Off-route effects of noise or vibration arising from the operation of the Proposed Scheme, including those likely to arise from permanent changes in traffic patterns on roads or railways outside of the study area for direct effects are reported in Volume 4.
- 1.2.5 In undertaking the assessment of sound, noise and vibration, consistent with EIA Regulations and emerging National Planning Practice Guidance¹ a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV001-000.
- 1.2.6 The assessment of impacts has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The Assessment Locations employed in this assessment are presented on map series Sv-02 in the CFA14 Volume 5 sound, noise and vibration map book.

¹ National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk> ; refer to the table summarising noise exposure hierarchy

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group (Acoustics), information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group (Acoustics), the following local policy guidance on noise and vibration has been identified:

- South Northamptonshire Local Plan 1997;
- Aylesbury Vale District Local Plan - Jan 2004; and
- Cherwell Local Plan – 1996.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5, particularly Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1, Section 8.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration
- September / October 2012; a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012; specific request for the Community Forum to propose baseline sound monitoring locations;
- January / February 2013; feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written response to questions on sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1), is clarified in a number of areas by the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1, Section 8, and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of operational sound noise and vibration within this CFA are set out in Volume 2: Report 14.

2.5 Local limitations

- 2.5.1 In this area, there are a number of locations where the land or property owners did not permit baseline sound level monitoring to be undertaken at their premises. However, sufficient information has been obtained to undertake the assessment. Further information is provided in Volume 5: Appendix SV-002-014.

3 Environmental baseline

3.1 Existing baseline

3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are included within Table 3. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-014.

3.1.2 The majority of receptors adjacent to the line of the route are not currently subject to appreciable vibration and therefore vibration at all receptors has been assessed using the absolute vibration criteria as described in Volume 5: Appendix SV-001-000.

3.2 Future baseline

3.2.1 The assessment is based upon the predicted change in sound levels that result from the Proposed Scheme. The assessment initially considered a reasonable worst case (that would overestimate the change in levels) by assuming that sound levels would not change from the existing baseline year of 2012/2013. Where significant effects were identified on this basis, the effects have been assessed using the baseline year of 2026 to coincide with the proposed start of passenger services. The future baseline is for the sound environment that would exist in 2026 without the Proposed Scheme.

4 Effects arising during operation

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
 - Ground-borne sound and vibration
 - Residential
 - Non-residential
 - Airborne sound
 - Residential
 - Non-residential
- Assessment of impacts and effects
 - Residential receptors: direct effects – dwellings
 - Residential receptors: direct effects – communities
 - Residential receptors: indirect effects
 - Non-residential receptors: direct effects
 - Non-residential receptors: indirect effects
 - Cumulative effects from the proposed scheme and other committed development.

4.2 Avoidance and mitigation measures

4.2.1 These are set out in Volume 2: Report 14.

4.3 Quantitative identification of impacts and effects

Ground-borne sound and vibration

4.3.1 Assessment locations defined for the quantitative assessment of impacts are shown on map series SV-02 in the CFA14 Volume 5 sound, noise and vibration map book.

4.3.2 For each Assessment Location, the assessment results for residential and non-residential receptors are presented in Table 1. Explanation of the information in Table 1 is provided in Appendix SV-001-000, with the following additional notes.






B	For non-residential receptors further detail about the type of effect is set out in the text of Volume 5: Appendix SV-001-000.
NA	Type of effect - Generally no adverse effect
A	Type of effect - Adverse effect
S	Type of effect - Significant adverse effect
VDV	Vibration Dose Value
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000).
^	The impact methodology has identified a potential significant effect at this receptor which based upon further qualitative information is not considered to be a likely significant effect. Please refer the end of this Appendix for further information.
	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced residential community area, or individual receptor.
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact
	Dark red denotes a very high ground-borne noise impact

Table 1: Ground-borne sound and vibration levels, noise and vibration impacts and effects

Assessment location		Impact criteria				Significance criteria								Significant effect
		Ground-borne sound level dB L _{pASmax}	VDV m/s ^{1.75} Daytime (07:00 - 23:00)	VDV m/s ^{1.75} Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
ID	Area represented													
277206	Newton Purcell, Buckingham	-	0.14	0.07	-	1	NA	R	T	-	-	-	-	-
277496	Banbury Road, Finmere	-	0.15	0.08	-	1	NA	R	T	-	-	-	-	-

Impact summary





- 4.3.3 The operational ground-borne noise and vibration impacts identified in Table 1 are summarised in Table 2.

Table 2: Summary of operational ground-borne noise and vibration impacts

	Number of ground-borne sound impacts			
	Low	Medium	High	Very High
Residential properties	0	0	0	0
Non-residential properties	0			0
	Number of ground-borne vibration impacts			
	Minor	Moderate	Major	Risk of building damage
Residential properties	0	0	0	0
Non-residential properties	0			0

Airborne sound: direct impacts and effects

- 4.3.4 The direct effects from the operation of the Proposed Scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the scheme, are presented in Table 3.
- 4.3.5 The assessment information, impact criteria and significance criteria for the assessment of the incorporated mitigation case at residential and non-residential receptors are presented in Table 3. The results should be considered in conjunction with the information contained in map series Sv-02 in the CFA14 Volume 5 sound, noise and vibration map book.
- 4.3.6 Explanation of the Table 3 information is provided in Volume 5: Appendix SV001-000, with the following additional notes.

	Where the significant effect column is marked, then a significant effect is identified at the referenced group of dwellings, or individual residential or non-residential receptor.
	Yellow denotes a minor impact at a residential building – a change is of 3-5 dB
	Orange denotes a moderate impact at a residential building – a change is of 5-10 dB
	Red denotes a major impact at a residential building – a change is of >10 dB
*	Day - $L_{pAeq,07:00-23:00}$
**	Night - $L_{pAeq,23:00-07:00}$
***	Max - L_{pAFMax} In the Proposed Scheme only column, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information refer to Volume 5: Appendix SV-001-000.
****	Where the Proposed Scheme modifies an existing source, i.e. road or railway realignments, the <i>Proposed Scheme only</i> level in the table includes the sound from the modified source. In this situation the <i>Do something (Opening year baseline + Year 15 traffic)</i> level has been corrected so as to not double count the sound associated with the road or railway on its new and existing alignment.
A	Adverse effect
B	For non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000.

CD	Committed Development. The value in brackets in the number of impacts represented column is the value with the committed development.
G	(G1)Theatres, large auditoria and concert halls, (G2) Sound recording and broadcast studios, (G3) Places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) Schools, colleges, hospitals, hotels and libraries, and (G5) Offices and general commercial premises
H	High existing ambient sound level. Defined as $>65\text{dB}_{\text{Aeq, day}}$ and/or $>55\text{dB}_{\text{Aeq, night}}$
L	Low existing ambient sound level. Defined as $<42\text{dB}_{\text{Aeq, day}}$ and/or $<32\text{dB}_{\text{Aeq, night}}$
LD	Landscape receptor
NA	Generally no adverse effect
NI	The receptor is predicted to qualify for mitigation, which shall be provided to the specification defined in the Noise Insulation (Railways and other Guided Rail Systems) Regulations 1996
R	Residential
RM	Residential mooring
S	Significant adverse effect
U	Unacceptable adverse effect
#	A change of 3dB or greater has been identified however, the assessment methodology only defines an impact where the absolute sound level from the Proposed Scheme is greater or equal to 50 dB $L_{\text{pAeq, 23:00} - 07:00}$ during the daytime or 40 dB $L_{\text{pAeq, 07:00} - 23:00}$ at night. At the receptor denoted the absolute level condition is not met and therefore no impact is identified.
~	The forecast adverse effects are not considered to be significant on a community basis (further information on methodology is provided in Volume 5: Appendix SV-001-000)..
\$	A change of 3dB or greater has been identified however, the impact methodology for non-residential receptors includes a screening criteria for G3 building use of 50 dB $L_{\text{pAeq, 07:00} - 23:00}$, for G4 building use 55 dB $L_{\text{pAeq, 07:00} - 23:00}$ and 45 dB $L_{\text{pAeq, 23:00} - 07:00}$, for G5 building use 55 dB $L_{\text{pAeq, 07:00} - 23:00}$. At the receptor denoted the screening criteria is not met and therefore no impact is identified. Further information is provided in Volume 5: Appendix SV-001-000.
^	The impact methodology has either identified an impact at a receptor which based upon further qualitative information does not gives rise to a significant effect. Further information is provided at the end of this Appendix.

Table 3: Operational airborne sound level, noise impacts and effects

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
266177	John Clare Close, Brackley	52	45	55/58	58	54	64	59	54	0	0	A	26	R	T	-	-	-	-	
266596	Radstone, Brackley	52	43	63/66	47	39	50	53	44	5	5	A	1	R	T	-	-	-	-	~
266631	Radstone, Brackley	59	50	75/78	55	46	50	60	51	5	5	A	1	R	T	-	-	-	-	~
267247	South Bank, Turweston	40	32	52/55	51	43	53	51	43	0	0	NA	8	R	T	-	-	-	-	
268637	Main Street, Turweston	39	30	50/53	47	39	52	47	39	1	0	NA	2	R	T	-	-	-	-	
268683	Chapel Lane, Turweston	43	35	56/59	47	39	52	48	40	1	1	NA	12	R	T	-	-	-	-	
270056	Turweston, Brackley	58	50	74/77	58	54	64	61	55	3	1	A	3	R	T	-	-	-	-	~
270079	Northampton Road, Brackley	56	51	61/64	58	54	64	56	51	-3	-3	A	2	R	T	-	-	-	-	
270561	Radstone, Brackley	53	44	70/73	42	37	43	53	44	11	7	A	1	R	T	L	Y	-	-	OSV14-Co3
273397	Radstone, Brackley	53	45	69/72	45	38	43	54	45	9	7	A	3	R	T	-	-	-	-	OSV14-Co3
273418	Radstone, Brackley	50	41	65/68	60	28	33	60	41	0	13	A	1	R	T	L	Y	-	-	OSV14-Co3
273468	Radstone, Brackley	54	45	71/74	42	37	43	54	45	12	8	A	1	R	T	L	Y	-	-	OSV14-Co3
273513	Radstone, Brackley	50	42	62/66	42	37	43	51	42	9	5	A	3	R	T	L	Y	-	-	OSV14-Co3
273532	Radstone, Brackley	51	42	68/71	42	37	43	51	43	9	6	A	1	R	T	L	Y	-	-	OSV14-Co3
273535	Radstone, Brackley	50	41	67/70	49	42	54	52	44	3	2	A	1	R	T	-	-	-	-	OSV14-Co3
273549	Radstone, Brackley	49	40	65/68	49	42	54	52	44	3	2	A	2	R	T	-	-	-	-	#
273561	Radstone, Brackley	50	41	67/70	49	42	54	52	44	3	2	A	6	R	T	-	-	-	-	OSV14-Co3
273586	Radstone, Brackley	45	39	53/56	42	37	43	45	39	2	2	NA	1	R	T	L	Y	-	-	
275510	Mixbury, Brackley	56	47	67/70	49	41	48	57	48	7	7	A	1	R	T	-	-	-	-	~

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
275606	Banbury Road, Finmere	40	31	51/54	58	52	83	58	52	0	0	NA	1	R	T	-	-	-	-	
275991	Mixbury, Brackley	42	33	55/58	46	41	47	48	42	1	1	NA	16	R	T	-	-	-	-	
276471	Church View, Mixbury	43	34	57/60	46	41	47	48	42	2	1	NA	12	R	T	-	-	-	-	
276513	Evenley Road, Mixbury	46	36	59/62	46	41	47	49	42	3	1	NA	8	R	T	-	-	-	-	#
276541	Church Lane, Mixbury	45	36	58/61	46	41	47	49	42	2	1	NA	1	R	T	-	-	-	-	
276587	Mixbury, Brackley	45	36	59/62	46	41	47	49	42	3	1	NA	11	R	T	-	-	-	-	#
276675	Mixbury, Brackley	43	33	57/60	46	41	47	48	42	2	1	NA	4	R	T	-	-	-	-	
276694	Mixbury, Brackley	45	35	52/55	49	47	56	50	47	1	0	NA	1	R	T	-	-	-	-	
276761	Fulwell Lane, Mixbury	46	36	54/57	49	47	56	50	47	2	0	NA	5	R	T	-	-	-	-	
276781	Mixbury, Brackley	53	44	65/68	46	42	48	54	46	7	4	A	2	R	T	-	-	-	-	~
276837	Mixbury, Brackley	48	38	61/64	46	41	47	50	43	4	2	NA	1	R	T	-	-	-	-	#
276848	Mixbury, Brackley	47	38	59/62	46	41	47	49	43	3	2	NA	3	R	T	-	-	-	-	#
276941	Newton Purcell, Buckingham	51	44	61/64	46	42	51	51	44	4	2	A	1	R	T	-	-	-	-	~
276979	Newton Purcell, Buckingham	52	44	61/64	71	68	83	71	68	0	0	A	1	R	T	H	-	-	-	
276994	Fulwell House, Brackley	46	38	56/59	45	39	49	48	41	3	2	NA	1	R	T	-	-	-	-	#
277041	Newton Purcell, Buckingham	47	37	63/66	61	58	83	62	58	0	0	NA	5	R	T	H	-	-	-	
277059	Newton Purcell, Buckingham	48	39	62/65	61	58	83	62	58	0	0	NA	5	R	T	H	-	-	-	
277073	Newton Purcell, Buckingham	52	44	62/65	66	63	83	66	63	0	0	A	2	R	T	H	-	-	-	
277167	Newton Purcell, Buckingham	49	42	60/63	45	39	49	49	42	4	3	A	4	R	T	-	-	-	-	~
277188	Newton Purcell, Buckingham	50	43	60/63	46	41	51	50	43	4	2	A	3	R	T	-	-	-	-	~

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
277206	Newton Purcell, Buckingham	60	51	74/77	60	54	68	60	51	0	-3	A	1	R	T	-	-	-	-	
277221	Newton Purcell, Buckingham	53	44	65/68	55	49	68	56	50	1	1	A	3	R	T	-	-	-	-	
277239	Newton Purcell, Buckingham	57	49	68/71	55	49	68	57	49	1	0	A	4	R	T	-	-	-	-	
277261	Newton Purcell, Buckingham	62	54	73/77	66	60	75	62	54	-4	-6	A	2	R	T	H	-	-	-	
277315	Banbury Road, Finmere	58	50	70/74	46	44	56	58	50	12	6	A	1	R	T	-	-	-	-	~
277403	Banbury Road, Finmere	55	50	62/65	50	48	56	55	50	5	2	A	9	R	T	-	-	-	-	OSV14-Co1
277496	Banbury Road, Finmere	66	57	73/76	50	48	56	66	57	16	10	S	1	R	T	-	-	-	NI	OSV14-Do1
277548	Fulwell House, Brackley	43	34	58/61	49	41	48	50	42	1	1	NA	1	R	T	-	-	-	-	
277630	Fulwell, Brackley	42	32	56/59	49	41	48	50	41	1	1	NA	4	R	T	-	-	-	-	
277959	Newton Purcell, Buckingham	50	42	59/62	50	45	54	52	46	2	1	A	1	R	T	-	-	-	-	
278675	Banbury Road, Finmere	43	35	56/59	71	65	83	71	65	0	0	NA	2	R	T	H	-	-	-	
278708	Foxley Fields Farm, Finmere	46	37	58/62	49	37	39	50	40	2	3	NA	1	R	T	-	-	-	-	#
279188	Banbury Road, Finmere	45	37	55/58	49	47	56	50	47	1	0	NA	1	R	T	-	-	-	-	
279198	A421, Finmere	49	41	59/62	49	47	56	51	47	2	1	A	1	R	T	-	-	-	-	
279895	Turweston, Brackley	50	42	61/64	52	45	51	54	46	1	1	A	2	R	T	-	-	-	-	
280457	Turweston, Brackley	44	36	51/54	52	47	55	52	47	0	0	NA	1	R	T	-	-	-	-	
280564	Main Street, Turweston	51	42	63/66	48	46	49	52	47	4	1	A	3	R	T	-	-	-	-	OSV14-Co2
280584	Turweston, Brackley	52	43	65/68	49	48	47	53	49	4	1	A	2	R	T	-	-	-	-	OSV14-Co2
280717	Turweston, Brackley	48	39	64/67	47	43	48	50	44	3	1	A	2	R	T	-	-	-	-	#
280726	Turweston, Brackley	49	40	61/64	48	46	49	51	47	3	1	A	4	R	T	-	-	-	-	#

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
280734	The Green, Turweston	51	45	62/65	47	43	48	51	45	4	2	A	4	R	T	-	-	-	-	OSV14-Co2
280761	Turweston, Brackley	52	44	64/67	47	41	47	52	44	5	3	A	3	R	T	-	-	-	-	OSV14-Co2
280811	Main Street, Turweston	49	41	60/63	51	43	53	52	44	1	1	A	4	R	T	-	-	-	-	
280902	Turweston, Brackley	44	35	56/59	51	43	53	52	43	1	1	NA	16	R	T	-	-	-	-	
280949	Turweston, Brackley	52	44	61/64	47	41	47	52	44	5	3	A	2	R	T	-	-	-	-	OSV14-Co2
281018	Turweston, Brackley	51	43	62/65	47	41	47	51	43	4	2	A	4	R	T	-	-	-	-	~
281078	Turweston, Brackley	48	40	58/61	47	41	47	49	42	2	1	A	4	R	T	-	-	-	-	
281109	Turweston, Brackley	53	45	67/70	49	48	47	53	49	4	1	A	1	R	T	-	-	-	-	OSV14-Co2
281175	Turweston, Brackley	52	43	66/71	49	48	47	53	49	4	1	A	1	R	T	-	-	-	-	OSV14-Co2
281182	Turweston, Brackley	51	42	66/70	49	48	47	53	49	4	1	A	1	R	T	-	-	-	-	OSV14-Co2
281733	Mill Lane, Westbury	46	37	59/62	51	42	48	52	44	1	1	NA	51	R	T	-	-	-	-	
281804	Brackley Road, Westbury	43	34	56/59	49	41	48	50	42	1	1	NA	5	R	T	-	-	-	-	
281858	Westbury, Brackley	40	32	50/53	52	47	55	52	47	0	0	NA	1	R	T	-	-	-	-	
281938	Turweston, Brackley	44	36	53/56	47	41	47	48	42	1	1	NA	1	R	T	-	-	-	-	
282022	Turweston, Brackley	43	35	52/55	52	47	55	52	47	0	0	NA	1	R	T	-	-	-	-	
282403	Mill Lane, Westbury	43	33	55/58	49	41	48	50	42	1	1	NA	14	R	T	-	-	-	-	
282953	Orchard Place, Westbury	43	34	58/61	49	41	48	50	42	1	1	NA	3	R	T	-	-	-	-	
283304	Brackley Road, Westbury	42	33	55/58	49	41	48	50	42	1	1	NA	11	R	T	-	-	-	-	
700432	Turweston Road, Brackley	50	42	56/59	58	54	64	59	54	0	0	A	2	R	T	-	-	-	-	
700474	Turweston, Brackley	47	38	59/62	51	43	53	52	44	1	1	NA	1	R	T	-	-	-	-	

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
711002	Committed Development CFA14/11	43	34	56/59	54	49	64	54	50	0	0	NA	1	CD	T	-	-	-	-	
711026	Committed Development CFA14/14	52	42	64/67	55	46	50	56	48	2	2	A	1	CD	T	-	-	-	-	
268683	Scout Hall, Chaple Lane, Turweston, (Hall)	43	35	56/59	47	39	52	48	40	1	1	B	1	G3	T	-	-	-	-	\$
273483	St. Lawrence's Church, Radstone, (Church)	54	45	72/75	42	37	43	54	45	12	8	B	1	G3	T	-	-	-	-	OSV14-No1
276541	All Saint's Church, Mixbury, (Church)	45	36	58/61	46	41	47	49	42	2	1	B	1	G3	T	-	-	-	-	\$
276941	Newton Purcell (Surgery)	51	44	61/64	46	42	51	51	44	4	2	B	2	G4	T	-	-	-	-	\$
276994	St Michael's Church, Newton Purcell (Church)	46	38	56/59	45	39	49	48	41	3	2	B	1	G3	T	-	-	-	-	\$
280717	St. Mary's Church, Turweston, (Church)	50	42	64/67	47	43	48	50	44	3	1	B	1	G3	T	-	-	-	-	\$
280811	Main Street, Turweston, (Hall)	49	41	60/63	51	43	53	52	44	1	1	B	1	G3	T	-	-	-	-	
282403	West Works, Playing Field Road, Westbury (Office)	43	33	55/58	49	41	48	50	42	1	1	B	1	G5	T	-	-	-	-	
282403	The Pavilion, Brackley Road, Westbury (Office)	43	33	55/58	49	41	48	50	42	1	1	B	1	G5	T	-	-	-	-	
282403	Mill Farm, Mill Lane, Westbury (General Commercial)	43	33	55/58	49	41	48	50	42	1	1	B	1	G5	T	-	-	-	-	
282403	Beachborough Preparatory School (School)	43	33	55/58	49	41	48	50	42	1	1	B	1	G4	T	-	-	-	-	

Assessment Location		Impact criteria										Significance criteria								Significant effect
ID	Area represented	Proposed Scheme only (Year 15 traffic)			Do nothing (Opening year baseline)			Do something (Opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation of effect	
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
282403	Playing Field Road, Westbury, (General Commercial)	43	33	55/58	49	41	48	50	42	1	1	B	2	G5	T	-	-	-	-	
282953	St. Augustine's Church, Orchard Place (Church)	43	34	58/61	49	41	48	50	42	1	1	B	1	G3	T	-	-	-	-	
700432	Burwell Farm, Turweston Road (General Commercial)	50	42	56/59	58	54	64	59	54	0	0	B	1	G5	T	-	-	-	-	

Direct impact - Summary

4.3.7 The operational airborne noise impacts identified in Table 3 are summarised in Table 4.

Table 4: Summary of operational airborne sound impacts

Receptor	Number of impacts		
	Minor	Moderate	Major
Residential properties	34	26	5
Non-residential properties	0	0	1
Quiet areas	None	None	None

4.4 Assessment of impacts and effects

Residential receptors: direct effects - individual buildings

- 4.4.1 Taking account of the avoidance and mitigation measures incorporated into the Proposed Scheme, the assessment has identified one residential dwelling close to the Proposed Scheme, Oaks Farm, Banbury Road, Finmere, represented by receptor reference 277496 (marked as OSV14-Do1 in Table 3) where noise would exceed the daytime trigger threshold set in the Regulations. It is therefore estimated that this building is likely to qualify for noise insulation under the Regulations. It is indicated on Volume 5: Map Book - Sound, noise and vibration, Map series SV-02.
- 4.4.2 The mitigation measures including noise insulation will reduce noise inside all dwellings such that it will not reach a level where it would significantly affect residents.

Residential receptors: direct effects – communities

- 4.4.3 The mitigation measures in this area will avoid airborne noise adverse effects on the majority of receptors, and at the following residential communities:
- Newton Purcell;
 - Finmere (except as mentioned in Table 5);
 - Mixbury;
 - Westbury;
 - Turweston (except as mentioned in Table 5);
 - Whitfield; and
 - Brackley.

- 4.4.4 Taking account of the envisaged mitigation, Map Series SV-02 (Volume 5, CFA14Map book) shows the long term 40dB² night-time sound level contour from the operation of trains on the Proposed Scheme. The extent of the 40dB night-time sound level contour is equivalent to, or slightly larger than, the 50dB daytime contour³. In general, below these levels adverse effects are not expected.
- 4.4.5 Above 40dB during the night and 50dB during the day the effect of noise is dependent on the baseline sound levels in that area and the change in sound level (magnitude of effect) brought about by the Proposed Scheme. The airborne noise impacts and effects forecast for the operation of the scheme are presented on Map Series SV-02 (Volume 2, CFA14 Map Book).
- 4.4.6 The changes in noise levels are likely to affect the acoustic character of the area such that there is a perceived change in the quality of life and are considered to be significant when assessed on a community basis⁴ taking account of the local context.
- 4.4.7 The existing baseline environment in the community of Radstone is very quiet, being substantially less than 50 dB daytime and / or 40 dB night-time in some areas of the village. The existing environment is characterised by little or no appreciable man-made sound sources. Such environments are rare in this part of England and hence it is considered a unique feature. Taking account of the forecast operational noise levels, an effect is identified on the unique feature of an existing environment characterised by little or no man made sources.
- 4.4.8 Approximately 20 isolated properties within the area have been identified as being subject to an observed adverse noise effect; these effects are likely to be considered as an effect on the acoustic character of the area such that there is a perceived change in the quality of life. However, as the affected properties are spatially remote from larger defined residential areas, are subject to smaller magnitudes of noise effect, or are small in number, the effects are not considered to be significant.
- 4.4.9 In this study area, the direct adverse effects⁵ on the areas of the residential communities identified in Table 5 are considered to be significant.

Table 5: Direct adverse effects on residential communities and shared open areas that are considered significant on a community basis

Significant effect number (see Map series SV-02 Table 1 and 3)	Source of significant effect	Time of day	Location and details
OSV14-C01	Airborne noise increase from new train services	Daytime and night-	Finmere. Approximately 10 dwellings to the west of Finmere in the vicinity of the residential community area around Warren Farm on Banbury Road, and associated local

² Defined as the equivalent continuous sound level from 23:00 to 07:00 or $L_{pAeq,night}$.

³ With the train flows described in the assumptions section of this CFA Report, the daytime sound level (defined as the equivalent continuous sound level from 07:00 to 23:00 or $L_{pAeq,day}$) from the Proposed Scheme would be approximately 10dB higher than the night-time sound level. The 40dB contour therefore indicates the distance from the Proposed Scheme at which the daytime sound level would be 50dB.

⁴ Further information is contained in Volume 1.

⁵ Information is provided in the emerging National Planning Practice Guidance – Noise: <http://planningguidance.planningportal.gov.uk>.

Significant effect number (see Map series SV-02 Table 1 and 3)	Source of significant effect	Time of day	Location and details
		time	community open areas. Forecast increases in sound from the railway are likely to cause a moderate adverse effect on the acoustic character of the area.
OSV14-C02	Airborne noise increase from new train services	Daytime and night-time	Turweston. Approximately 25 dwellings in the vicinity of Main Street and associated local community open areas. Forecast increases in sound from the railway are likely to cause a moderate adverse effect on the acoustic character of the area around the five or so dwellings closest to the Proposed Route, and a minor adverse effect on the acoustic character around the remaining dwellings.
OSV14-C03	Airborne noise increase from new train services	Daytime and night-time	Radstone. Approximately 15 dwellings and associated community open areas. Forecast increases in sound from the railway are likely to cause a major adverse effect on the acoustic character of the area around the dwellings closest to the Proposed Route reducing to a minor effect around the dwellings farthest away.

Residential receptors: indirect effects

- 4.4.10 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.
- 4.4.11 The assessment of operational noise and vibration indicates that significant indirect effects on residential receptors are unlikely to occur in this area.

Non-residential receptors: direct effects

- 4.4.12 The assessment has identified airborne noise impacts at St Lawrence Church, Radstone, represented by receptor reference 273483.

St Lawrence Church, Radstone

- 4.4.13 A major impact has been identified at St. Lawrence's Church, Radstone based upon the change in the airborne noise level outside this receptor. An assessment has been undertaken to determine if this impact would result in a significant effect at this non-residential receptor, using the significance criteria detailed in Volume 5: Appendix 001-000.

- 4.4.14 This receptor is located approximately 250m from the Proposed Scheme alignment. St. Lawrence's is a medieval church, circa 12th century. The walls are coursed squared limestone, and stone rubble with a combination of tiled and lead roof. Stained glass windows to east and west windows. Ventilation is considered to be provided by opening of windows.
- 4.4.15 St. Lawrence's Church is identified, on a precautionary basis, as being subject to a significant adverse effect denoted by OSV14-No1 in Table 3 and drawing SV-02 (see CFA14 Volume 5 sound, noise and vibration map book). This may take the form of the activity disturbance to the people using the church.
- 4.4.16 The assessment of any effect of noise inside St Lawrence's Church is on a worst case basis. It assumes that any activities that are more sensitive to noise take place in the internal areas of the church that have windows, doors or other openings (for example on the bell tower) on the façade facing the route and that little sound insulation is provided by the windows, doors or other openings.

Summary

- 4.4.17 The assessment of operational noise and vibration indicates that significant effects are likely on the non-residential receptors identified in Table 6.
- 4.4.18 The assessment of effects on non-residential receptors has been undertaken on a worst case basis taking account of publicly available information about each receptor.

Table 6: Likely significant noise or vibration effects on non-residential receptors arising from operation of the Proposed Scheme

Significant effect number (see Map series SV-02 Table 1 and 3)	Type of significant effect and source	Time of day	Location and details
OSV14-No1	Major airborne noise effect on the acoustic character around the church and on a worst case basis there is a risk of disturbing activities ⁶ inside church buildings due to the operation of train services.	Daytime	St Lawrence's Church, Radstone

Non-residential receptors: indirect effects

- 4.4.19 The transport assessment presented in Volume 5: Appendix TR-001-000, has been used to identify those roads or railways within this study area where the alignment remains as at present, but a change in flow or composition is identified which is greater than the screening criteria defined in Volume 5: Appendix SV-001-000. No roads or railways which exceed the criteria defined in Volume 5: Appendix SV-001-000 have been identified in this study area.
- 4.4.20 The assessment of operational noise and vibration indicates that significant indirect effects are unlikely to occur on non-residential receptors in this area.

⁶ Potential risk of activity disturbance, especially for activities that require good conditions for verbal communication.

Cumulative effects

- 4.4.21 Details of properties being currently developed which were afforded planning approval before the safeguarding date are presented in Volume 5: Appendix CToo4-000. Within this area, the operational sound, noise or vibration associated with these developments in conjunction with the operation of the Proposed Scheme do not result in any significant cumulative effects.